

Geology of British North America.

British North-American Boundary Commission. Report on the Geology and Resources of the Region in the Vicinity of the Forty-ninth Parallel, from the Lake of the Woods to the Rocky Mountains; with Lists of Plants and Animals collected, and Notes on the Fossils. By G. M. DAWSON, Assoc. R.S.M., F.G.S., Geologist and Botanist to the Commission. 8vo, 379 pages; with plates and woodcuts. Montreal, London, and New York. 1875.

Mr. Dawson, during the two seasons of arduous work on this Survey, devoted his attention chiefly to the geological structure of the country; but, with the aid of his colleagues, he got together a collection of Insects (described by Mr. S. H. Scudder, in Appendix D), of Unionidæ (described by Dr. P. P. Carpenter, in Appendix E), and Grasses, Mosses, &c. (described by Prof. Macoun and Mr. G. Barnston, in Appendix F). Dr. Elliott Coues, accompanying the United-States contingent of the Boundary Survey as Naturalist, has zoological reports in preparation.

The geological observations extend over 800 miles across the central region of the continent, hitherto geologically examined in some parts only, and for 300 miles in longitude not even geographically known previously. Thus Mr. Dawson has worked out some important links between what was known of the geology and fossils north of his line (from the labours of Richardson, Bigsby, Isbister, Hind, Hector, Owen, Keating, Meek, Heer, Selwyn, and Bell), and what was known of the geology of the U.S. Territories on the headwaters of the Missouri, Yellowstone, Kansas, &c. (from the Surveys for the Pacific Railways, the U.S. Surveyors, and other sources).

Laurentian, Huronian, Lower and Upper Silurian, and Devonian rocks are noticed in succession, going from the Lake of the Woods, through Manitoba; and the possible existence of Carboniferous rocks, under the prairies, but probably without good coal-seams, is adverted to. Permian and Triassic strata are wanting. The Cretaceous beds succeed, but rest on different bed-rocks in different localities. They are not yet known in detail here; but further south, in Upper Missouri, Meek and Hayden make them 26,000 feet thick. The Tertiary Lignitic beds succeed, as on the north and the south. These are famous for their stores of fossil fuel, for their abundant vertebrate remains, and for their interesting, but as yet not sufficiently disentangled, geological history. These, with the Cretaceous beds below them, reach to the borders of the Rocky Mountains; but a thick mantle of sands and clays, referable to the Glacial Period and to former great lakes, covers almost the entire surface of the enormous plains of which they are the substrata.

The capabilities of the country with regard to settlement are carefully considered, and the maintenance and planting of forests especially insisted on as indispensable.

Dr. J. W. Dawson, F.R.S., supplies Appendix A (with a Plate),

on the fossil plants from the Lignitic shales, and points out their "Miocene" characters, as compared with other fossil floræ of North America and Europe; but, seeing that Reptiles of Mesozoic types are associated with them, that *Baculites* and *Inocerami* occur also in the Lignitic series, and that a similar fossil flora occurs with "Cretaceous" marine animal remains in both Dakota and Vancouver, he declines to assign these transitional beds to a definite systematic period, unless it be Lower Eocene, when the "Cretaceous" fauna would thus seem to have persisted in the sea, whilst the land was becoming covered with a new flora. He enumerates:—*Filices*, 2; *Equisetaceæ*, 2; *Coniferæ*, 3; *Monocotyledones*, 4; *Dicotyledones*, 15. Several fossil woods examined by the microscope are also described and illustrated.

The fossil plants above mentioned came—some from "Poreupine Creek," agreeing with the "Fort-Union group" of Nebraska, and others from "Great Valley," more nearly corresponding with the "Green-River group." The shales of the first of these groups, at Milk River, yielded fragmentary remains of several Dinosaurs, Tortoises, and Gar-fishes, determined by Prof. Cope, in Appendix B, as *Cionodon stenopsis*, *Hadrosaurus*?, *Trionyx vagans*(?), *Trionyx* sp.(?), *Plastomenus costatus*, *Pl. coalescens*, *Compsemys ogmius*, *C.?* *victus*, *Clastes*, sp.

The Report has a good Index. It is well printed, and is illustrated throughout with numerous careful sections, mostly copied by "photo-engraving" from pen-and-ink sketches by the author.

Geology of Indiana.

Fifth Annual Report of the Geological Survey of Indiana, made during the year 1873, by E. T. Cox, State Geologist, assisted by Prof. JOHN COLLETT, Prof. W. W. BORDEN, and Dr. G. M. LEVETTE. 8vo, 494 pages, with maps, views, and sections. Indianapolis, 1874.

In continuation of former Reports (noticed in the 'Annals,' July 1873), Mr. E. T. Cox and his assistants present the results of their further surveys in Indiana. Rich in coal and iron, this region demands the attention of metallurgists, as the chief portion of the Report satisfactorily shows. Indeed in the interest of the American iron-workers, Reports, by Mr. Hartmann, on the Exhibition of coal and iron at the Universal Exposition at Vienna, on the Iron and Steel Industries of Rhenish Prussia and Westphalia, with a map, and on the manufacture of *Spiegeleisen* (pp. 5–101), precede the Geological Report of Indiana. This latter continues to give careful details of local geology, notices of all minerals and stones of commercial value, and of the manufactures and agricultural resources. The Antiquities, some of the most remarkable in the world, are not neglected; for frequent mention is made of the Mound-builders and of their shell-heaps, tools, and extensive works. At a bend of the Wabash River, in Posey County, an isolated bank, 35 feet high, overhangs the river, which has eaten it half away